



Anette

SEQUENCE LISTING

<110> WASHINGTON UNIVERSITY

<120> ANTI-BACTERIAL COMPOUNDS DIRECTED AGAINST PILUS
BIOGENESIS, ADHESION AND ACTIVITY; CO-CRYSTALS OF PILUS
SUBUNITS AND METHODS OF USE THEREOF

<130> WSHU2005.1

<140> US 09/637,216

<141> 2000-08-11

<150> US 60/148,280

<151> 1999-08-11

<160> 65

<170> PatentIn Ver. 2.1

<210> 1

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 1

Asn Val Leu Gln Ile Ala Leu

1

5

<210> 2

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 2

Gly Lys Val Thr Phe Asn Gly Thr Val Val

1

5

10

<210> 3
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 3
Gly Thr Val His Phe Lys Gly Glu Val Val
1 5 10

<210> 4
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 4
Gly Lys Val Thr Phe Phe Gly Lys Val Val
1 5 10

<210> 5
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 5
Gly Thr Ile Val Ile Thr Gly Thr Ile Thr
1 5 10

<210> 6
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 6

Gly Thr Ile Val Ile Thr Gly Ser Ile Ser
1 5 10

<210> 7

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 7

Gly Thr Val Lys Phe Val Gly Ser Ile Ile
1 5 10

<210> 8

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 8

Gly Glu Ile Gln Leu Lys Gly Glu Ile Val
1 5 10

<210> 9

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 9

Gly Thr Ile Lys Phe Thr Gly Glu Ile Val
1 5 10

<210> 10
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 10
Asn Glu Val Thr Phe Leu Gly Ser Val Ser
1 5 10

<210> 11
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 11
Gly Thr Ile Asn Phe Glu Gly Ser Val Val
1 5 10

<210> 12
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 12
Ser Asp Val Ala Phe Arg Gly Asn Leu Leu
1 5 10

<210> 13
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 13

Gly Arg Ala Ala Phe His Gly Glu Val Val
1 5 10

<210> 14

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 14

Gly Arg Ala Thr Phe His Gly Glu Val Val
1 5 10

<210> 15

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 15

Asp Asn Leu Thr Phe Arg Gly Lys Leu Ile
1 5 10

<210> 16

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 16

Asp Asn Leu Thr Phe Lys Gly Lys Leu Ile
1 5 10

<210> 17

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 17

Gly Trp Leu Asn Leu Gln Gly Thr Ile Leu
1 5 10

<210> 18

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 18

Ser Val Val Asn Ile Thr Gly Asn Val Gln
1 5 10

<210> 19

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 19

Thr Thr Ile Thr Val Thr Gly Asn Val Leu
1 5 10

<210> 20

<211> 10

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 20
Thr Thr Ile Thr Val Thr Gly Arg Val Leu
1 5 10

<210> 21
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 21
Cys Met Leu Ala Gly Ser Asn Phe Val Thr
1 5 10

<210> 22
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 22
Val Gln Ile Asn Ile Arg Gly Asn Val Tyr
1 5 10

<210> 23
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 23
Pro Asn Leu Lys Leu Phe Gly Thr Leu Leu
1 5 10

<210> 24
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 24
Val Tyr Ile Asn Ile Thr Gly Asn Val Ile
1 5 10

<210> 25
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 25
Gly Lys Ile Thr Phe Asn Gly Lys Val Val
1 5 10

<210> 26
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 26
Gly Thr Ile Asn Phe Asn Gly Lys Ile Thr
1 5 10

<210> 27
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 27
Gln Lys Thr Ile Phe Ser Ala Asp Val Val
1 5 10

<210> 28
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 28
Gly Gln Val Asn Phe Phe Gly Lys Val Thr
1 5 10

<210> 29
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 29
Gln Arg Thr Ile Ile Thr Ala Asp Val Val
1 5 10

<210> 30
<211> 7
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 30
Gly Ser Leu Ser Leu Ala Ile
1 5

<210> 31
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 31
Asn Tyr Leu Gln Phe Ala Ile
1 5

<210> 32
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 32
Ser Gly Ile Ala Val Ala Leu
1 5

<210> 33
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 33
Asn Ile Leu Gln Leu Ala Ile
1 5

<210> 34
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 34
Ser Phe Met Gln Ile Ala Ile
1 5

<210> 35
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 35
Asn Tyr Leu Gln Phe Ala Val
1 5

<210> 36
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 36
Asn Thr Leu Gln Leu Ala Ile
1 5

<210> 37
<211> 7
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 37

Gly Val Leu Gln Leu Thr Ile
1 5

<210> 38

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 38

Asn Val Leu Ala Val Ala Val
1 5

<210> 39

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 39

Ser Leu Leu Gln Leu Ala Phe
1 5

<210> 40

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 40

Ser Gly Ile Ala Val Ala Val
1 5

<210> 41

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 41

Asn Ala Leu Lys Phe Ala Met
1 5

<210> 42

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 42

Asn Val Leu Gln Met Ala Met
1 5

<210> 43

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 43

Asn Tyr Leu Gln Phe Ala Ile
1 5

<210> 44

<211> 7

<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 44
Asn Val Leu Gln Ile Ala Val
1 5

<210> 45
<211> 7
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 45
Leu Asn Val Asn Val Val Thr
1 5

<210> 46
<211> 7
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 46
Val Phe Val Gln Phe Ala Ile
1 5

<210> 47
<211> 7
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 47
Met Lys Leu Asn Val Ser Ile
1 5

<210> 48
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 48
Met Asp Ile Gln Met Ser Ile
1 5

<210> 49
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 49
Leu Asn Ile Leu Leu Ser Val
1 5

<210> 50
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 50
Met Asn Ile Gln Val Ser Val
1 5

<210> 51
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 51
Asp Ser Ile Asn Ile Ser Ile
1 5

<210> 52
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Sequence

<400> 52
Leu Asn Val Gln Leu Ser Val
1 5

<210> 53
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 53
catcgctggc acaggaagga gc

22

<210> 54
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 54
gttggtatga cccgcatcaa tcgc

24

<210> 55
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Proteins

<400> 55
Asn Thr Leu Gln Leu Ala Ile Ile Ser Arg
1 5 10

<210> 56
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthesized
Proteins

<400> 56
Asp Val Thr Ile Thr Val Asn Gly Lys
1 5

<210> 57
<211> 157
<212> PRT
<213> Escherichia coli

<400> 57
Ser Asp Val Ala Phe Arg Gly Asn Leu Leu Asp Arg Pro Cys His Val
1 5 10 15

Ser Gly Asp Ser Leu Asn Lys His Val Val Phe Lys Thr Arg Ala Ser
20 25 30

Arg Asp Phe Trp Tyr Pro Pro Gly Arg Ser Pro Thr Glu Ser Phe Val
35 40 45

Ile Arg Leu Glu Asn Cys His Ala Thr Ala Val Gly Lys Ile Val Thr

50	55	60
Leu Thr Phe Lys Gly Thr Glu Glu Ala Ala Leu Pro Gly His Leu Lys		
65	70	75 80
Val Thr Gly Val Asn Ala Gly Arg Leu Gly Ile Ala Leu Leu Asp Thr		
	85	90 95
Asp Gly Ser Ser Leu Leu Lys Pro Gly Thr Ser His Asn Lys Gly Gln		
100	105	110
Gly Glu Lys Val Thr Gly Asn Ser Leu Glu Leu Pro Phe Gly Ala Tyr		
115	120	125
Val Val Ala Thr Pro Glu Ala Leu Arg Thr Lys Ser Val Val Pro Gly		
130	135	140
Asp Tyr Glu Ala Thr Ala Thr Phe Glu Leu Thr Tyr Arg		
145	150	155

<210> 58
 <211> 163
 <212> PRT
 <213> Escherichia coli

<400> 58
 Ala Pro Thr Ile Pro Gln Gly Gln Gly Lys Val Thr Phe Asn Gly Thr
 1 5 10 15

Val Val Asp Ala Pro Cys Ser Ile Ser Gln Lys Ser Ala Asp Gln Ser
 20 25 30

Ile Asp Phe Gly Gln Leu Ser Lys Ser Phe Leu Glu Ala Gly Gly Val
 35 40 45

Ser Lys Pro Met Asp Leu Asp Ile Glu Leu Val Asn Cys Asp Ile Thr
 50 55 60

Ala Phe Lys Gly Gly Asn Gly Ala Lys Lys Gly Thr Val Lys Leu Ala
 65 70 75 80

Phe Thr Gly Pro Ile Val Asn Gly His Ser Asp Glu Leu Asp Thr Asn
 85 90 95

Gly Gly Thr Gly Thr Ala Ile Asx Asx Gln Gly Ala Gly Lys Asn Asx
 100 105 110

Asx Phe Asp Gly Ser Glu Gly Asp Ala Asn Thr Leu Lys Asp Gly Glu
115 120 125

Asn Val Leu His Tyr Thr Ala Val Val Lys Lys Ser Ser Ala Val Gly
130 135 140

Ala Ala Val Thr Glu Gly Ala Phe Ser Ala Val Ala Asn Phe Asn Leu
145 150 155 160

Thr Tyr Gln

<210> 59

<211> 148

<212> PRT

<213> Escherichia coli

<400> 59

Asp Asn Leu Thr Phe Arg Gly Lys Leu Ile Ile Pro Ala Cys Thr Val
1 5 10 15

Ser Asn Thr Thr Val Asp Trp Gln Asp Val Glu Ile Gln Thr Leu Ser
20 25 30

Gln Asn Gly Asn His Glu Lys Glu Phe Thr Val Asn Met Arg Cys Pro
35 40 45

Tyr Asn Leu Gly Thr Met Lys Val Thr Ile Thr Ala Thr Asn Thr Tyr
50 55 60

Asn Asn Ala Ile Leu Val Gln Asn Thr Ser Asn Thr Ser Ser Asp Gly
65 70 75 80

Leu Leu Val Tyr Leu Tyr Asn Ser Asn Ala Gly Asn Ile Gly Thr Ala
85 90 95

Ile Thr Leu Gly Thr Pro Phe Thr Pro Gly Lys Ile Thr Gly Asn Asn
100 105 110

Ala Asp Lys Thr Ile Ser Leu His Ala Lys Leu Gly Tyr Lys Gly Asn
115 120 125

Met Gln Asn Leu Ile Ala Gly Pro Phe Ser Ala Thr Ala Thr Leu Val
130 135 140

Ala Ser Tyr Ser
145

<210> 60
 <211> 148
 <212> PRT
 <213> Escherichia coli

<400> 60
 Asp Val Gln Ile Asn Ile Arg Gly Asn Val Tyr Ile Pro Pro Cys Thr
 1 5 10 15
 Ile Asn Asn Gly Gln Asn Ile Val Val Asp Phe Gly Asn Ile Asn Pro
 20 25 30
 Glu His Val Asp Asn Ser Arg Gly Glu Val Thr Lys Thr Ile Ser Ile
 35 40 45
 Ser Cys Pro Tyr Lys Ser Gly Ser Leu Trp Ile Lys Val Thr Gly Asn
 50 55 60
 Thr Met Gly Gly Gly Gln Asn Asn Val Leu Ala Thr Asn Ile Thr His
 65 70 75 80
 Phe Gly Ile Ala Leu Tyr Gln Gly Lys Gly Met Ser Thr Pro Leu Ile
 85 90 95
 Leu Gly Asn Gly Ser Gly Asn Gly Tyr Gly Val Thr Ala Gly Leu Asp
 100 105 110
 Thr Ala Arg Ser Thr Phe Thr Phe Thr Ser Val Pro Phe Arg Asn Gly
 115 120 125
 Ser Gly Ile Leu Asn Gly Gly Asp Phe Gln Thr Thr Ala Ser Met Ser
 130 135 140
 Met Ile Tyr Asn
 145

<210> 61
 <211> 218
 <212> PRT
 <213> Escherichia coli

<400> 61
 Ala Val Ser Leu Asp Arg Thr Arg Ala Val Phe Asp Gly Ser Glu Lys
 1 5 10 15

Ser Met Thr Leu Asp Ile Ser Asn Asp Asn Lys Gln Leu Pro Tyr Leu
 20 25 30
 Ala Gln Ala Trp Ile Glu Asn Glu Asn Gln Glu Lys Ile Ile Thr Gly
 35 40 45
 Pro Val Ile Ala Thr Pro Pro Val Gln Arg Leu Glu Pro Gly Ala Lys
 50 55 60
 Ser Met Val Arg Leu Ser Thr Thr Pro Asp Ile Ser Lys Leu Pro Gln
 65 70 75 80
 Asp Arg Glu Ser Leu Phe Tyr Phe Asn Leu Arg Glu Ile Pro Pro Arg
 85 90 95
 Ser Glu Lys Ala Asn Val Leu Gln Ile Ala Leu Gln Thr Lys Ile Lys
 100 105 110
 Leu Phe Tyr Arg Pro Ala Ala Ile Lys Thr Arg Pro Asn Glu Val Trp
 115 120 125
 Gln Asp Gln Leu Ile Leu Asn Lys Val Ser Gly Gly Tyr Arg Ile Glu
 130 135 140
 Asn Pro Thr Pro Tyr Tyr Val Thr Val Ile Gly Leu Gly Gly Ser Glu
 145 150 155 160
 Lys Gln Ala Glu Glu Gly Glu Phe Glu Thr Val Met Leu Ser Pro Arg
 165 170 175
 Ser Glu Gln Thr Val Lys Ser Ala Asn Tyr Asn Thr Pro Tyr Leu Ser
 180 185 190
 Tyr Ile Asn Asp Tyr Gly Gly Arg Pro Val Leu Ser Phe Ile Cys Asn
 195 200 205
 Gly Ser Arg Cys Ser Val Lys Lys Glu Lys
 210 215

<210> 62

<211> 278

<212> PRT

<213> Escherichia coli

<400> 62

Phe Ala Cys Lys Thr Ala Asn Gly Thr Ala Ile Pro Ile Gly Gly Gly
 1 5 10 15

Ser Ala Asn Val Tyr Val Asn Leu Ala Pro Val Val Asn Val Gly Gln
 20 25 30

Asn Leu Val Val Asp Leu Ser Thr Gln Ile Phe Cys His Asn Asp Tyr
 35 40 45

Pro Glu Thr Ile Thr Asp Tyr Val Thr Leu Gln Arg Gly Ser Ala Tyr
 50 55 60

Gly Gly Val Leu Ser Asn Phe Ser Gly Thr Val Lys Tyr Ser Gly Ser
 65 70 75 80

Ser Tyr Pro Phe Pro Thr Thr Ser Glu Thr Pro Arg Val Val Tyr Asn
 85 90 95

Ser Arg Thr Asp Lys Pro Trp Pro Val Ala Leu Tyr Leu Thr Pro Val
 100 105 110

Ser Ser Ala Gly Gly Val Ala Ile Lys Ala Gly Ser Leu Ile Ala Val
 115 120 125

Leu Ile Leu Arg Gln Thr Asn Asn Tyr Asn Ser Asp Asp Phe Gln Phe
 130 135 140

Val Trp Asn Ile Tyr Ala Asn Asn Asp Val Val Val Pro Thr Gly Gly
 145 150 155 160

Cys Asp Val Ser Ala Arg Asp Val Thr Val Thr Leu Pro Asp Tyr Pro
 165 170 175

Gly Ser Val Pro Ile Pro Leu Thr Val Tyr Cys Ala Lys Ser Gln Asn
 180 185 190

Leu Gly Tyr Tyr Leu Ser Gly Thr Thr Ala Asp Ala Gly Asn Ser Ile
 195 200 205

Phe Thr Asn Thr Ala Ser Phe Ser Pro Ala Gln Val Gly Val Gln Leu
 210 215 220

Thr Arg Asn Gly Thr Ile Ile Pro Ala Asn Asn Thr Val Ser Leu Gly
 225 230 235 240

Ala Val Gly Thr Ser Ala Val Ser Leu Gly Leu Thr Ala Asn Tyr Ala
 245 250 255

Arg Thr Gly Gly Gln Val Thr Ala Gly Asn Val Gln Ser Ile Ile Gly
 260 265 270

Val Thr Phe Val Tyr Gln
275

<210> 63
<211> 161
<212> PRT
<213> Escherichia coli

<400> 63
Asp Thr Thr Pro Thr Thr Val Asn Gly Gly Thr Val His Phe Lys Gly
1 5 10 15

Glu Val Val Asn Ala Ala Cys Ala Val Asp Ala Gly Ser Val Asp Gln
20 25 30

Thr Val Gln Leu Gly Gln Val Arg Thr Ala Thr Leu Lys Gln Ala Gly
35 40 45

Ala Thr Ser Ser Ala Val Gly Phe Asn Ile Gln Leu Asn Asn Cys Asp
50 55 60

Thr Thr Val Ala Thr Lys Ala Ala Val Ala Phe Leu Gly Thr Ala Ile
65 70 75 80

Asp Ser Thr His Pro Lys Val Leu Ala Leu Gln Ser Ser Ala Ala Gly
85 90 95

Ser Ala Thr Asn Val Gly Val Gln Ile Leu Asp Arg Thr Gly Asn Glu
100 105 110

Leu Thr Leu Asp Gly Ala Thr Phe Ser Ala Glu Thr Thr Leu Asn Asn
115 120 125

Gly Thr Asn Thr Ile Pro Phe Gln Ala Arg Tyr Phe Ala Thr Gly Ala
130 135 140

Ala Thr Pro Gly Ala Ala Asn Ala Asp Ala Thr Phe Lys Val Gln Tyr
145 150 155 160

Gln

<210> 64
<211> 153
<212> PRT

<213> Escherichia coli

<400> 64

Asp Ser Thr Ile Thr Ile Arg Gly Tyr Val Arg Asp Asn Gly Cys Ser
1 5 10 15
Val Ala Ala Glu Ser Thr Asn Phe Thr Val Asp Leu Met Glu Asn Ala
20 25 30
Ala Lys Gln Phe Asn Asn Ile Gly Ala Thr Thr Pro Val Val Pro Phe
35 40 45
Arg Ile Leu Leu Ser Ser Cys Gly Asn Ala Val Ser Ala Val Lys Val
50 55 60
Gly Phe Thr Gly Val Ala Asp Ser His Asn Ala Asn Leu Leu Ala Leu
65 70 75 80
Glu Asn Thr Val Ser Ala Ala Ser Gly Leu Gly Ile Gln Leu Leu Asn
85 90 95
Glu Gln Gln Asn Gln Ile Pro Leu Asn Ala Pro Ser Ser Ala Leu Ser
100 105 110
Trp Thr Thr Leu Thr Pro Gly Lys Pro Asn Thr Leu Asn Phe Tyr Ala
115 120 125
Arg Leu Met Ala Thr Gln Val Pro Val Thr Ala Gly His Ile Asn Ala
130 135 140
Thr Ala Thr Phe Thr Leu Glu Tyr Gln
145 150

<210> 65

<211> 143

<212> PRT

<213> Escherichia coli

<400> 65

Asp Val Thr Ile Thr Val Asn Gly Lys Val Val Ala Lys Pro Cys Thr
1 5 10 15
Val Ser Thr Thr Asn Ala Thr Val Asp Leu Gly Asp Leu Tyr Ser Phe
20 25 30
Ser Leu Met Ser Ala Gly Ala Ala Ser Ala Trp His Asp Val Ala Leu
35 40 45

Glu	Leu	Thr	Thr	Cys	Pro	Val	Gly	Thr	Ser	Arg	Val	Thr	Ala	Ser	Phe
	50					55					60				
Ser	Gly	Ala	Ala	Asp	Ser	Ile	Gly	Tyr	Tyr	Lys	Asn	Gln	Gly	Thr	Ala
65					70					75					80
Gln	Asn	Ile	Gln	Leu	Glu	Leu	Gln	Asp	Asp	Ser	Gly	Asn	Thr	Leu	Asn
			85						90					95	
Thr	Gly	Ala	Thr	Lys	Thr	Val	Gln	Val	Asp	Asp	Ser	Ser	Gln	Ser	Ala
			100					105						110	
His	Phe	Pro	Leu	Gln	Val	Arg	Ala	Leu	Thr	Val	Asn	Gly	Gly	Ala	Thr
		115					120					125			
Gln	Gly	Thr	Ile	Gln	Ala	Val	Ile	Ser	Ile	Thr	Tyr	Thr	Tyr	Ser	
	130					135					140				